REMARKS

In response to the objection to the Abstract, this amendment revises the substitute Abstract provided by amendment June 27, 2005. The Abstract is less than 150 words in length, and does not use the word "invention". Furthermore, the Abstract has been revised to reference to the two features discussed at the interview, and which are present in various independent claims presented herein. That is, the Abstract references the physical separation step, as may occur in a high speed centrifuge, and references the concept of assuring that the concentration of fire retardant chemicals being applied is the same in each dye machine during the semi-parallel, continuos processing of several batches of fibers, for example. The amended Abstract should now be in compliance with the Patent Rules.

In response to the objection to the specification, page 90 of the application has been amended to use capital letters for the trademarked products. The precise chemical nature of the trademarked products is not precisely known, or needed to practice the claimed invention; rather, these commercially available products are simply identified as materials that include vinyl chloride latices.

The information disclosure statement filed August 17, 2004 is being reviewed.

As discussed during the Interview which took place December 13, 2005, to simplify prosecution of the application, claims 1-9, 11-13, and 16-78 have been canceled. This cancellation eliminates issues related to claim 27 identified in the office action. The application now includes a total of three independent claims (claims 79, 91, and 99), each of which were discussed during the Interview. Further application now includes a total of thirty one claims (claims 10, 14, 15, 79-106). Claims 10, 14, and 15 have been amended to account for claim dependency. New claims 102 to 106 have been added and reflect subject matter discussed at the interview and subject matter contained within the canceled claims. Claims 79, 91, 95, 99, 100, and 101 have been amended.

Of the remaining claims, claims 79, 80, and 83-101 were rejected as being obvious over U.S. Patent 5,156,890 to Rock, and claims 10, 14, 15, 81, and 82

were rejected as being obvious over Rock in view of U.S. Patent 3,944,688 to Inman. The Inman reference was relied upon only for its teachings with respect to certain constituents, and does not show or suggest any features which make up for the deficiencies of Rock which were discussed in detail at the Interview. Thus, both of these rejections are traversed in view of the amendments above, and remarks below.

Also, at the Interview, the concept of having the flame retardant composition being free of dye or other contaminating agents was discussed. These agents are simply not part of the closed loop process described in the specification. As discussed during the Interview, each of the independent claims maintains the requirement the flame retardant composition is free of dye or other contaminating agents. Thus, claims 79-98 are in compliance with 35 U.S.C. 112, first paragraph.

During the Interview, Figure 1 of the application was discussed in detail. An exemplary closed loop system is described in detail on pages 94-110 of the application. The major points discussed at the Interview are as follows:

1) In one embodiment, the process involves the transfer of depleted fire retardant composition from a first vessel to a second vessel, and the physical separation of excess fire retardant composition from the substrate.

Note, for example, the flow of fire retardant composition from first dye machine 32 through pipe 74 to second dye machine 34. Page 100, lines 26-31, explains that the after the flame retardant composition has impregnated the fibers, for example, the flame retardant composition is then permitted to travel into fourth line 74. Page 102, lines 24-30, explains that "Quantity X of flame retardant solution will travel into the second dye machine 34 via line 74" and that "Some of the flame retardant composition in the first dye machine 32 (quantity W) will be depleted as a result of treating substrates (quantity Z)". (emphasis added)

Also note that the embodiment shown in Figure 1 of the application includes two centrifuges 12 and 14 which are separate from the first and second dye machines 32 and 34. As explained on page 101 of the application at line 16 et seq., a lifting device such as a crane lifts baskets from the dye machine and places the baskets in the centrifuges. "Excess flame retardant composition resulting from

the first centrifuge 12 flows by gravity into a ninth line 86...and then into a first collection tank 16" (emphasis added-see lines 25-28 on page 101).

Thus, it should be understood that in one embodiment of the invention, flame retardant composition which is recycled is obtained from both a) the dye machine and b) the centrifuge (or other physical separating device such as rollers). For convenience, to distinguish the two sources of flame retardant composition which are obtained after substrates, such as fibers, are treated with flame retardant composition, claims have been revised to use the words "depleted " (as set forth on page 102), and "excess" (as set forth on page 101). In particular, see independent claim 79 which refers at two locations to the "depleted" and the "excess" (this being due to two transfer and two removing steps); and see dependent claim 95. Independent claim 99 simply uses the term "excess" in the recovering step to distinguish the portion of flame retardant composition which is later used in recycling, and in claim 99 "excess" would include, for example, the flame retardant composition from both the dye machines and the centrifuges. Dependent claim 100 uses the term "depleted", as dependent claim 100 introduces the concept of removing fibers from the vessels.

2) In another embodiment, the process involves combining depleted fire retardant composition with a concentrated solution of the fire retardant composition.

As explained at the Interview, once constituents are absorbed from the fire retardant composition into the fibers (or other substrates), the remaining composition is depleted (i.e., it has less fire retardant in fluid composition since some of the fire retardant is impregnated in the fibers). Page 104 of the application, at lines 13 et seq. explains that chemicals in collection tank 20 (which are recovered from the centrifuges) travel to the second mix tank 30. In the second mix tank 30, additional chemicals from source 102 are added. Page 105, lines 3 et seq. explains that the flame retardant composition in the second mix tank is "concentrated" (see line 3), that is it has "a higher concentration of flame retardant substances, adhesion agents, and optional components in comparison with the flame retardant compositions that are employed in the first and second

dye machines, 32 and 34" (see lines 3-5 on page 105). Page 105, lines 11-14 explains that the concentrated flame retardant composition "can be diluted to the desired flame retardant composition weight percents in the second dye machine 34 (that traveled therein from th the first dye machines 32 via line 74) and, if necessary, by the addition of water" (note water source 66).

Thus, as explained at the Interview, it is preferred to treat every batch of fibers (or other substrates) that are treated in the parallel batch, continuous process performed using the two dye machines 32 and 34 with the same concentrations of chemicals. Page 106, lines 6-9 of the application explains "Within the same operation of the system 10 (an operation of one or more cycles of Phase 1 and/or Phase 2), the components of the flame retardant compositions employed in the first dye machine 32 and in the second dye machine 34, and the weight percents thereof will generally be approximately the same". In this way, fibers (or other substrates) which are treated at the beginning of the day in one batch will have the same amount of absorbed fire retardant composition as fibers (or other substrates) which are treated at the end of the day in another batch.

Claims 91 and 102 to 104 each relate to the concept of combining the flame retardant composition which is depleted from the dye machine 32 or 34 with a concentrated composition from the associated mix tank 28 or 30 to achieve a composition that is substantially the same. Claim 91 requires combining said excess flame retardant composition recovered in said recovering step with one or more substances to produce a flame retardant composition which has weight percents of constituents which is the same or approximately the same as said flame retardant composition used in said applying step. Claim 102 requires wherein said re-using step including the step of combining said depleted flame retardant composition with a concentrated flame retardant composition in each of said first and second vessels. Claim 103 requires said portion of said flame retardant composition which is physically separated and collected in step b) is used in said concentrated flame retardant composition. Claim 104 requires wherein said flame retardant composition includes one or more constituents at specified concentrations during said applying step, and wherein said re-using step includes the step of adjusting one or more constituents in said flame retardant

composition to achieve said specified concentrations.

The claims, as amended are not obvious over Rock or a combination of Rock and Inman, because neither reference makes obvious either of the two features discussed in detail above.

As noted above, Inman describes preparation of fire resistant and water repellent fabric. It is particularly focused on chemical constituents, and has been relied upon by the Examiner only for its showing of chemical constituents. As such, Inman does not make up for any of the deficiencies of Rock discussed in detail below.

Rock describes retrofitting conventional laundry equipment so that it can be used to apply flame retarding chemicals to fabrics. See column 2, lines 48; column 3, line 54; Example 1 in column 5 lines 27-55 (where denim pants are treated with a wash, spin, and flame retardant rinse); and Figure 2 (which shows a retrofit of a conventional laundering apparatus). In the background, Rock explains that water soluble retardant finishes have the disadvantage that they wash out of the fabric quickly, and that durable fire retardant coatings (which do not wash out) have the disadvantages that it is expensive to treat clothing with such finishes, and that clothes treated with durable finishes tend to be highly wrinkled on washing. Thus, Rock envisions a system where a conventional laundering system can be used to repetitively apply a water soluble fire retardant finish to fabric. This way the fabric will essentially always be fire retardant during use (i.e., the washing out problem is solved by repetitive application) and will not be excessively wrinkled (as occurs with clothes that have a durable finish).

In contrast, the present invention is specific to high volume industrial applications and is designed to yield fibers where fire retardant chemicals have penetrated the cross-section. The fibers are then used to fabricate any of a variety of articles, and the resulting articles have a fire retardant property. While a variety of materials may be treated with the present invention, the present invention is not intended for repeated application of fire retardant chemicals to a fabric during a washing cycle. The present invention does not wash or spin the fibers which are being impregnated with fire retardant chemicals. Page 14, line 30 of the

application indicates "substrates within the invention have an ability to retain one or more flame retardant properties after they have been washed, laundered and or dry cleaned one or more times and will not melt when exposed to an open or other flame or fire".

With reference to Figure 1 of Rock, it can be seen that the load of laundry is first washed (detergent cycle 1) and rinsed (rinse cycle 3), with several spin cycles in between. Then a water soluble retardant is applied to the damp clothing (retardant cycle 5). The laundry is then subjected to a spin cycle 6, and flame retardant chemicals are filtered (see Filter 19 in Figure 2) and stored for use on the next load of laundry (see store retardant 8 in Figure 1). Column 4 lines 27 explains that the filter 19 removes lint and other particulate matter from the aqueous flame retardant solutions. Once the cycle is completed in Rock, a single batch of laundry is completed, and excess free run aqueous flame retardant material is stored for use on the next batch. Rock does not describe any process step similar to pulling fibers through rollers to remove excess flame retardant or high speed centrifuging to remove excess flame retardant.

The Examiner has acknowledged that Rock does not teach more than one treatment vessel, but has concluded that such a set up would be conventional to industrial operations. The undersigned disagrees with the conclusion drawn by the Examiner and requests proof of the same. More importantly, the undersigned notes that if the Rock system were implemented in an "industrial" type setting, it would likely be, for example, at a company which needs to repetitively wash large numbers of uniforms, and such an organization would likely have several of the Rock laundering devices such that several loads of laundry can be washed and be treated with flame retardant substances. However, this multiplying of the Rock system does not yield or make obvious the claimed invention, and differs in that you simply have a number of batch processes that can be run simultaneously.

The present application describes a continuous process whereby after the initial "mother solution" is prepared in phase 1, subsequent cycles will generally include either recycled flame retardant composition or a combination of recycled flame retardant composition and fresh made solution (i.e. stored in tank 20, etc.). See particularly, page 99 lines 27 et seq.

With reference to Figure 1 of the application, the text of the application, and the detailed discussion set forth above, in one embodiment of the invention initially baskets loaded with fiber are inserted into a first dye machine 32 (see Figure 1). In the first dye machine, fire retarding chemicals and other additives are pushed through the fibers in the baskets under pressure. The excess solution which does not impregnate the fibers (i.e., that part which is not absorbed) is then transferred to a second dye machine by means of pump 46 (the text of the application on page 100 indicates that after the flame retardant composition has been caused to circulate for a sufficient time to impregnate the substrates, valve 54 (Figure 1) is opened so that the solution travels to the second dye machine 34 using pump 46). After this cycle, a crane or other device is used to lift the substrates and transfer them to one or more centrifuges 12 and 14 (see page 101, lines 20 et seq.). The centrifuges are used to physically remove excess flame retardant composition from the fibers. This can also be done by pulling the fibers between rollers (see page 62, beginning at line 23.

Rock simply does not contemplate two distinct processes for recycling the fire retardant composition. As noted above. Claim 79 has separate and distinct transferring and removing steps. Claim 95 has separate transferring and physically separating steps. Claim 100 has separate obtaining and physically separating steps. Rock, in sharp contrast, merely shows the flame retardant being filtered at 7 and stored at 8 (see Figure 1). Further, Rock suggests no physical separation technique akin to the centrifuging required by, for example, claims 87, 97, and 101.

As explained in detail on page 102 of the application beginning on line 18, and as is shown in Figure 1 of the application, the second dye machine 34 receives flame retardant solution from the first dye machine 32 (quantity X), but also receives flame retardant solution from second mix tank 30 (quantity Y). In this way, the continuous system provides for addressing depletions in the flame retardant composition as a result of treating substrates in the first dye machine 32. Page 104 at line 13 et seq. discusses adding either manually or automatically a sufficient amount of chemicals and water and recycled flame retardant composition to create a second "mother solution" in mix tank 30. The

concentrated second mother solution can be diluted with water from source 66 once in the dye machine 34. In this way, the second dye machine 34 has a flame retardant composition which has the same chemical constituent mixture as was used in the first dye machine 32.

After treatment in the second dye machine 34, and loading of new baskets of fibers in first dye machine 32, the cycle then repeats continuously. Even in the situation where a single run or single dye machine is used (see page 109), the transfer of flame retardant to the second dye machine, and subsequent adjustment of chemical constituents, is performed.

In sharp contrast, in Rock, there is no adjustment to the aqueous fire retardant composition. Rather, the composition will simply be depleted with each wash/application cycle, and all that can be done during operation of Rock is to top off the retardant that is being stored in tank 8.

With respect to claim 99, Rock does not contemplate application of flame retardant compounds to fibers (see also claims 105 and 106). Rock is focused on fabrics. Further, Rock does not contemplate using flame retardant composition recovered from a first vessel on substrates contained in a second vessel, and flame retardant composition recovered from a second vessel on substrates contained in a first vessel.

With respect to claims 79-90, 92-97, and 100-101, Rock does not show or suggest transferring depleted flame retardant composition from one vessel to another AND physically separating excess flame retardant composition from the fibers (or other substrated).

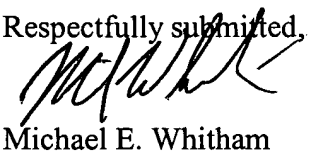
With respect to claims 91 and 102-104, Rock makes no provision to combine recycled flame retardant solution with additional chemicals to make a concentrated solution which is combined with a depleted flame retardent solution transferred or obtained from another vessel.

In view of the above, none of claims 10, 14, 15, and 79-106 would be obvious to one of ordinary skill in the art in view of Rock or Rock in combination with Inman.

If any extensions of time are required to gain entry of this response, provisional petition therefore is hereby made. If any fees are required to enter this

response or to gain entry of any other accompanying paper, the Commissioner is authorized to charge attorney's deposit account 50-2041 (Whitham, Curtis & Christofferson).

Respectfully submitted,



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